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Group of superior students were divided into experimental and control sections to test the value of an independent study course in personal hygiene. Achievement and change in attitudes toward health were approximately the same in both groups. xperimental students read more recommended references beyond the textbook and were more in favor of an independent study requirement for all students, but more control students planned to take a course in physiology in the future.

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INDEPENDENT STUDY IN PERSONAL HYGIENE

A Report on the Achievement of Selected Students Completing a Course in Personal Hygiene on an Independent Study Basis

by

Dorothy N. Naiman

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

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Introduction

Although the manner of expression may vary - "College is just like high school," "College is no challenge," or, "They expect to be spoonfed," "They don't know how to think," "They have no intellectual curiosity" - the statements and the behavior of many members of this college community reflect dissatisfaction with the intellectual climate of the college. (If hearsay evidence is to be accepted, Hunter College is not unique in this respect.) This dissatisfaction of students and faculty, together with the frequently-heard opinion that colleges do not seem to produce many self-sufficient, intelligently-acting members of society, provided the fundamental stimuli to this experiment in independent study on the undergraduate level.

The specific motive in undertaking the experiment was to investigate the possibility of provoking intellectual self-dependence and providing a new educational experience while retaining the manifold values of the more traditional course. Essentially, the purpose of the experiment was to determine whether a group of students, working fairly independently, guided but not supervised by the instructor, could achieve success in the study of personal hygiene. It was anticipated that the experience might also provide insight into more general aspects of an independent study program.

The overall objective of the "Personal Hygiene" course at Hunter College, where it is taught in the Department of Physiology, Health, and Hygiene by instructors trained in human biology, oriented towards the

medical sciences and interested in the relationship of Hygeia to Aesculapius, is "to develop in the student an understanding of the basic scientific information related to the maintenance and improvement of physical and mental health."[1] An examination of the detailed aims of the course (Appendix A) will reveal that this is a sizeable undertaking for a two-credit course meeting at most twenty-eight times during the course of a semester; however, the members of the Department are agreed that on the whole they have been able to achieve a reasonable measure of success. The primary functions of the course, of providing authentic information and of encouraging intelligent attitudes, and actions based thereon, are attended by singular difficulties. The mastery of Hygiene as a science requires an analytical approach to the known, the advertised, the presumed, and the unknown. But it also represents an attitude and a way of life - qualities difficult both to inculcate and to measure. For these, among other reasons, the problems of evaluating the results of this experiment are different from those which might be encountered in, for instance, an independent course in mathematics or in a foreign language, and any conclusions which may be drawn will need reinterpretation in terms of the objectives and subject matter of other courses, in order to be applicable to them.

Method

Before this experiment was actually undertaken, a number of students who had earned A's in Hygiene were consulted about their attitudes toward the course and their opinions about the desirability of greater

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[1]Syllabus for 62.1 prepared by Hygiene Course of Study Committee and approved by the Department of Physiology, Health and Hygiene, 1957.

independence in its pursuance. Their suggestions for conducting the course on an independent-study basis were taken into consideration when plans to attempt it were formulated. Also, it was determined that, not surprisingly, students with relatively high entrance scores, high school averages or college indices tend to receive high grades, A's and B's, in Hygiene. For the initial trial of this course on an independent basis, it was decided to select students who had, judging by their previous records, an appreciable likelihood of success in the standard course. Therefore, the students chosen to participate were those above the lower freshman term, who had composite entrance scores[2] of 1650 or higher, or high school averages of 86% or above, or college indices of 2.6 or better. Many, but not all, of the students so chosen would have been selected on the basis of all three criteria.

From the group of 54 students selected, half were placed in the experimental class and the other half in the control class. Because of drop-outs, conflicts, and other reasons, the final registers were: experimental section, 20 (6 men, 14 women), control section, 24 (4 men, 20 women).

Prior to the official registration period, these students received an explanatory letter (Appendix B), and a questionnaire (Appendix C) designed to elicit information about their experience in independent study and their attitudes toward college work. From their responses it appeared that 10 or 11 of the students had pursued some type of independent study. Table 1 summarizes answers to several questions about college courses.

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[2]Composite entrance scores are based on the high school average of academic subjects and on scores on the various achievement tests and the American Council of Education test.

Table 1

Students' Opinions Concerning Relative Difficulty of College and High School Courses

Opinion		Number	
College courses are	harder than	20	high school courses.
	easier than	1	
	about the same as	19	
College courses require	more effort than	31	high school courses.
	less effort than	0	
	about same effort as	10	
College courses require	more study time than	33	high school courses.
	less study time than	0	
	about same study time as	8	
Assignments are usually studied	before	24	topic is discussed in class.
	after	11	

Judging from comments made, the reasons for opinions about the relative difficulty of college courses tended to be based on the amount of material covered rather than on the complexity of the subject matter. Study practices seemed to vary chiefly with the nature of the subject matter and the degree of interest in it. To the question, "Are there any ways in which college courses differ from your expectations?" the

answers ranged so widely that it is difficult to make any generalizations. A number of responses indicated surprise that college work is not more difficult than it is; quite a few students expressed disappointment with various aspects of college courses; a few expressed real pleasure with the courses they had taken.

The members of both classes, meeting jointly at the first session, were given a brief statement outlining the purposes and methods of the experiment (Appendix D). They took two tests to determine the degree of similarity between the groups: (1) a pre-test in the subject matter, and (2) a vocabulary test[3] used as a measure of general ability. As is apparent from Table 2,[4] the two classes were similar both in the amount of hygiene information which they had and in their performance on the vocabulary test.

Table 2

Comparison of Students' Scores on Hygiene Information Test and Vocabulary Test Administered at Beginning of Semester.

Section	No.	Number in each college term 1	2	3	4	5	6	7	8	Hygiene Test (Mean raw score)[1]	Vocabulary Test (Mean raw score)[2]
M (experimental)	20	0	2	11	4	3	0	0	0	22.23	41.29
N (control)	24	0	5	15	2	2	0	0	0	23.27	43.43
K (unselected)	39	27	7	3	0	1	1	0	0	20.49	36.39
Total	83									21.69	38.31

[1]The means are not significantly different
[2]M and N means are alike; K group mean is significantly different from M and N group means.

[3]Cooperative Vocabulary Test, Form Z, of the Educational Testing Service.

[4]In all tabulations and statistical analyses of scores, a third class has been included. This "unselected" class, consisting of 39 students, was chosen as an additional basis of comparison only because it happened to have the same instructor. It participated in the experiment only to the extent that it was given the same tests at the same times in the term; otherwise it was treated so far as possible as a standard section.

Subsequent meetings of the two classes were held separately except for the occasions on which they took examinations. The students were asked not to consult members of the other class about the work of the course. Judging from questions purposely inserted into examinations, for which the control students had been primed in class but about which the experimental students would be unlikely to know, as well as from direct information elicited at the end of the term, there seemed to be fairly complete compliance with this request.

At the first separate meeting of the experimental class, the students were given printed material including (1) a plan of the course, (2) a schedule of stated meetings, and (3) a detailed syllabus, and were encouraged to ask whatever questions they wished. The syllabus contained a statement of the objectives of the course, a skeleton outline indicating the proportionate amount of time to be spent in each area and a very full outline of the subject matter; it also included collateral reading references not usually assigned, and extensive vocabulary lists relevant to the different topics. Appended to the syllabus were instructions for the submission of three required papers and one optional one, the latter announced as a project which would help prepare the student for part of the final examination, but devoid of credit.

The subsequent scheduled meetings of the experimental class were of two kinds: (1) four conference sessions without the instructor, during which the students formed small groups to discuss, on the basis of guides included in the agenda, pertinent facts and opinions about the recently covered work; each group selected a reporter whose rough notes on the

discussion were turned in to the instructor at the end of the period; (2) three question sessions with the instructor at which the students were encouraged to ask any questions that they had been unable to answer satisfactorily for themselves. The instructor made no effort during these sessions to direct attention to any particular points but urged the students to raise problems or express opinions relevant to the entire topic scheduled for coverage. In addition, these students, in accordance with usual procedure, were invited to consult the instructor privately if any problems arose.

The control class was given the same syllabus as the experimental class and was required to write the same papers. In addition, the students received a topical schedule for individual class meetings. As noted above, they were given tests and the final examination simultaneously with the experimental class. Both classes viewed several motion picture films.

Results

In order to evaluate this experiment, two kinds of questions must be answered: (1) Did the students in the experimental class meet the objectives of the course? (2) What benefits, if any, did the members of the experimental class derive from the experience of independent study?

The first of these questions divides naturally into a number of sub-questions:

(a) Did the experimental students acquire as much information as the control students?

(b) Were they as strongly stimulated to put their knowledge into practice, and to continue their education along these lines?

(c) Did they learn as satisfactorily as the control students to distinguish fact, fad, fallacy, and opinion, in the realm of hygiene?

(d) Did they gain an equal awareness of and interest in current health problems?

The three tests given during the course of the semester were almost entirely of the objective type, machine-scored and useful in answering sub-question (a). The assigned papers forced the students to relate their knowledge to practice and to evaluate their own health habits on the basis of hygiene information; how well they did this should provide some answers to sub-questions (b) and (c). The final examination was partly objective and partly in the form of essays, several short ones and one longer, analytical one; it was designed to test both factual information and the ability to utilize facts intelligently and with a sense of their relative importance. The actual grades for the course were based on the instructor's judgment of each student's record as a whole and in sum may serve to indicate the instructor's estimate of the caliber of work achieved by each class. Table 3 sets forth the scores of the separate classes on papers, tests,[5] the composite scores and term grades.

It is evident from the data presented in Table 3 that if there are differences between the achievement of the experimental and control groups, they have not been detected by the measures used. Certain imponderables undoubtedly remain unmeasured; the significance of these in the overall

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[5]It should be pointed out that the design of the experiment precluded test questions on any material not included in the textbook.

Table 3

Mean Scores and Grades for All Sections

Section	Papers[1]	Tests[3]	Final Examination		Composite Score	Final Grade[4]
			Objective	Essay		
M (experimental)	12.00	70.72	18.90	35.10	51.25	2.45
N (control)	12.75	73.11	19.57	36.09	53.65	2.83
K (unselected)	9.54[2]	69.06	18.41	31.59[2]	46.85	1.97[2]
Total	11.06		18.86	33.76	49.89	2.33

[1]Papers were graded A, B, C, etc., and converted to 4, 3, 2, etc. Each individual's scores were summed.
[2]K mean is significantly different ($p < .01$) from M and N means which were alike.
[3]Sum of composite scores on three tests.
[4]Letter grades were converted to appropriate numerical values.

evaluation of the experiment in this course is a point of considerable concern. The lack of opportunity for the instructor to gauge student attitudes afforded by the usual classroom situation is a defect inherent in the design of the experiment. However, it is possible that some answers to sub-questions (b) and (d) (pages 7 and 8) may be suggested by student responses to an extensive questionnaire and from student opinion elicited during small group conferences.[6]

While some students had been exposed in high school to some of the topics included in the course, few had delved deeply into more than one or two, at most. Most of the students felt that this is a demanding course, in the sense that a great deal of information must be thoroughly comprehended, and that it is an important one as a foundation for future

[6]The group conferences were conducted by Professor Marjorie B. Smiley, Director of the Office of Institutional Research, during the week following the final examination.

life. When asked to compare Hygiene with other required courses in the freshman-sophomore curriculum, 16 students in each section considered it to be at least as demanding as most, while three in each section found it less demanding than most.[7] It was the prevalent opinion that in most instances, even though some of the subject matter had been touched upon in high school courses in hygiene or in biology, and although some overlapped somewhat with the content of other college courses, the manner of handling the subject matter of Hygiene was more analytical, more mature and much more intensive than had previously been experienced. With one exception, the students were unanimous with respect to the importance of Hygiene as a required course in the curriculum; indeed, an appreciable number stated that its extensive coverage deserved more time and/or additional credit. Certain topics were singled out as requiring expansion at the expense of others if necessary. There was general agreement that the units on the Biological Foundations of the Family and on Mental Health should be given more time; there was only one topic widely selected as superfluous (health picture and health services).

The recorded group conferences yielded some interesting sidelights on the reasons why students felt that Hygiene is such an important course: "It is a good background for life," "People know so little about their

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[7]

	Experimental	Control
One of the most demanding	1	2
More demanding than most	6	3
As demanding as most	9	11

own bodies," "It is basic, for it deals with the whole person," "It changes one's attitudes; you can't just memorize, you have to understand," "High School Hygiene is inadequate and poor," "This deals with everyday life," etc. Some students acknowledged that their health behavior had changed as a result of the course; many more stated that they were now much more aware of their actions in this realm and of their shortcomings.

In this context, it may be of interest to note that about half the number of suggested exercises in the practical application of hygiene were actually carried out by each class as a whole. Similarly, about half the students of each section stated that they had read hygiene articles in addition to those listed in the syllabus and that they had read more health and science articles in newspapers than before. On the other hand, the students in the experimental class read almost ten times as many of the auxiliary articles as did those of the control class. Whether this contrast has any significance beyond the fact that the students in the experimental class wanted to be certain to cover the ground was not determined.

Questions concerning the value of independent study as one technique in the performance of college work as well as in preparation for post-graduate life are probably best answered by comparing the opinions and comments expressed by the students of the experimental class with those of the control. One immediate impression stands out from the remarks of both groups, namely that under the conditions of independent study the student feels himself to be hampered by insufficient knowledge of what will be included on tests, one implication being that one of the most

important functions of the instructor is to guide the student to successful results on examinations. While this is an indication of an unfortunate conflict between knowledge and grades in the minds of many students, the conflict is probably unavoidable under our system of evaluating academic achievement. A deeper implication of what is felt to be this disadvantage of independent study may be awareness that the instructor serves to highlight the more important aspects of the course and thereby enables the student to understand the relative importance of various portions of the material he is now studying as well as to improve his ability to evaluate related material in the future. In this connection, it may be mentioned that most of the students in the control class felt that the regular class meetings had been of considerable value.

Despite (1) the sense of loss experienced because of lack of direction, (2) the opinion, variously expressed, that the instructor presumably has stores of information not easily available to the student, and (3) the difficulties encountered in organizing study time (this organization being a built-in function of regular class meetings) and other less-frequently expressed disadvantages, it seemed evident that the majority of students of the experimental section enjoyed the experience, felt it had had considerable value for them as individuals and would be willing-to-happy-to-eager to attempt it in another course. Contrasted with this was the much greater hesitation of the control group to undertake independent study in the future, their lesser awareness of its possible values and their greater concern with its possible difficulties.

In addition, the latter students were much more dubious about the desirability of requiring all students to take at least one course on an independent basis than were those of the experimental group.

It may be of some interest to note the range of student reaction to the query: "If independent study courses became a regular part of the curriculum at Hunter, under what circumstances should they be offered?" There was no unanimity of opinion; some thought such courses should be offered only to upper classmen, others felt that college students should be able to handle them at any level and that it would provide a good introduction to college work for entering freshmen; some believed that independent study should be pursued only in selected subjects. Those suggested covered a wide area, including: the major, advanced courses, elementary courses, literature, mathematics, social sciences. The bases for the opinions were varied and ranged from the degree of interest in the particular subject (positive and negative correlation), through the reputation of the instructor, to the performance of the instructor during the first few weeks of a course!

Following are some comments and suggestions made by the experimental group about the technical aspects of the course:

(1) The students should be urged to prepare more thoroughly for group discussions and question sessions with the instructor.

(2) The instructor should volunteer more information at "question" sessions.

(3) Group discussions were of varying utility, although interesting, on the whole. They would be improved by better initial orientation in the management of discussion groups.

(4) Some of the readings and one of the films shown were considered of dubious value.

(5) The syllabus should include page assignments in the textbook.

(6) They read the text much more carefully than they would ordinarily have done.

Discussion

The superior students selected for the first trial of this experiment in independent study appeared, on the basis of the measures used, to learn approximately equal amounts of the subject matter of Hygiene whether they were in the control or in the experimental class. Similarly, as far as could be determined, their attitudes toward health and their adoption of recommended health practices changed to about the same extent. While the experimental students read far more of the recommended references beyond the textbook, the reading of other health articles in newspapers and other periodicals apparently increased to the same degree in both classes. The members of both groups agreed on the value of the course and recommended its retention as a degree requirement.

Significant differences between the classes appeared in two areas. In the first place, more than twice as many students in the control group as in the experimental one expressed the intention of taking a course in physiology in the future; secondly, the experimental students were much more receptive to the idea of an independent study requirement for all students than were the controls.

It would seem that any decision about the desirability of offering or requiring independent courses, and of giving them in Hygiene, based

upon this study, must depend on Faculty judgment of the relative weight of advantages and disadvantages. Among the advantages should be mentioned, first of all, the fact that this technique stimulates students to independent effort; perhaps it even arouses intellectual excitement. To what extent the degree of independence achieved would continue into the future or promote a new attitude toward intellectual endeavor, however, are questions whose answers lie in the future.

Other advantages to the student are obvious; this type of independent study permits the student to choose, within limits, his own time for study; it must either cause him to organize his time well, or at least demonstrate the results of not doing so; and it enables him to concentrate on areas of his greatest interest and/or ignorance.

Most of the disadvantages are equally obvious: opportunity for questioning the instructor and discussing difficult points with him are limited; rapport between student and instructor may be impaired; the inspiring of students' interest in a subject by the instructor's enthusiasm for it is much less likely to occur;[7] and the beneficial influence of guided class discussion about selected topics is lost. More specifically with respect to a course in hygiene, opportunities to disabuse students of misconceptions and to inculcate scientific attitudes concerning fundamental biological processes are at a minimum.

New developments in the physical sciences, new methods of travel, and problems related to the increasing world population all require a citizenry as well-informed as possible about the basic needs of the living

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[7]Nine of the control students but only four of the experimental students plan to take a course in physiology in the future.

human organism. Similarly, new developments in prophylaxis and therapy of physical and mental illness, as well as in the promotion of positive health, require decisions by people capable of understanding the recommendations of medical experts. Since many students take no biological science in college other than hygiene, it behooves us to make that course as intensive as possible. Whether the type of independent hygiene course investigated in this study is satisfactory is still an open question; perhaps more definite conclusions can be drawn when data from an unselected class are available. It may be that only intellectually superior students can complete the work of this course as satisfactorily as those in regular class sections.

Future Plans

The experiment is being continued this semester with two sections of 31 unselected students each. Two of the suggestions noted on pages 13 and 14 have been adopted:

(1) Text pages were supplied for the first unit, that on health services and the health picture.

(2) Selected volunteers from the first experimental class helped the new experimental class at their first group discussion meeting.[8]

The pre-test on hygiene information given these unselected students included both objective items and an essay. This test will be used as

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[8]It should be mentioned that members of both original sections were eager to be of assistance this semester. In addition to the three volunteers helping with orientation, four others gladly spent some 4-5 hours each, scoring the essay portion of the pre-test taken by the current experimental and control classes. This enthusiastic cooperation may in part reflect the pleasure that resulted for most of the students from the knowledge that they had been especially selected for the experiment.

part of the final examination at the end of the semester. It is hoped that by this procedure more precise evidence will be obtained regarding the degree of improvement in attitudinal as well as factual aspects of the course.[9]

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[9]On the second test taken by this semester's unselected students, the control class had significantly higher grades than the experimental class ($p < .05$).

Appendix A

"The course in Personal Hygiene seeks to develop in the student an understanding of the basic scientific information relating to the maintenance and improvement of physical and mental health. The specific aims are:

1. to assist the student to develop the understanding, critical judgment and values that will enable him to deal effectively with current and future health problems.

2. to encourage the student to accept responsibility for the maintenance of his own health and to assume an active role in the family health program.

3. to stimulate the student to become an intelligent consumer of health information and services; to develop in him a desire to disseminate such information for the benefit of his family and the community.

4. to educate the student to appreciate the need for participation in community health programs.

5. to stimulate the student to recognize the importance of research in health and the need for its support."[1]

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[1]Syllabus for 62.1, prepared by Hygiene Course of Study Committee and approved by the Department of Physiology, Health and Hygiene, 1957.

Appendix B

Hunter College in the Bronx
Department of Physiology, Health and Hygiene

September 3, 1957

Dear

When you receive your registration material you will notice that you have already been assigned to a particular section of B 62.1 (Personal Hygiene). You are one of a small group of students, chosen on the basis of high college entrance score or college index, to participate in an experiment with new methods of instruction in this course. After the first meeting of the class, one of the three 5th hours assigned to B 62.1 on your program will be cancelled; which of the hours it will be will depend upon whether you have been selected for the control class, which will be conducted in the traditional way, or for the experimental class in which most of the work will be carried on independent of classroom instruction.

We have made every effort to ensure that your program will not suffer by your advance assignment to this special section and trust that it will cause you no inconvenience. It will not be necessary for you to stand in line at registration to receive your B 62.1 course card. Please go to the side of the Physiology and Hygiene table, show your official program card to the person in charge and request a course card for the section indicated.

In order to help us conduct this experiment we would like to have the information indicated on the enclosed blank. Would you be kind enough to fill it out to the best of your ability and return it in the enclosed prepaid envelope at your earliest convenience. I am looking forward to meeting you on Tuesday, September seventeenth.

Sincerely yours,

/s/ Dorothy N. Naiman

Dorothy N. Naiman

DNN/rw
8/5/57

Appendix C

Hunter College in the Bronx
Department of Physiology, Health and Hygiene

Name_____Group No._____
(Last) (First)

Major: Undecided___ Will probably be_____Is going to be_____

How do the college courses you have taken thus far compare with the courses you had in the last two years of high school, as you remember them?

College courses are: Harder___ Easier___ About the same___

" " require More___ or Less___ or About the same___
effort on the part of the student

" " require More___ or Less___ or About the same___
amount of study time

Comment:

What independent study have you undertaken in the past?

In school or college:

Outside school or college:

None___

Are there any ways in which college courses differ from your expectations before entrance?

Do you customarily study your assignments Before___ or After___ the topics have been discussed in class? Does this vary according to any factors that you are aware of?

Appendix D

Statement read to both sections at first meeting, September 1957

"The object of trying this experiment, as you must have gathered from my letter, is to determine whether students can learn the subject matter of Personal Hygiene by independent study, guided, but not supervised, by the instructor. Since this is an experiment, we needed to have a control section as well as an experimental one, and for this reason, some of you are in section M and some in N. I should say right away that all of you are superior, or potentially superior, students who we know can do creditable work if you try. We were careful to select only those about whom we could say this with certainty. From the total number so chosen, half were placed at random in the experimental and half in the control class.

"I was very much interested to find in many of your responses to my questions, the sentiment, expressed in various ways, that you did not feel that college challenged you sufficiently. This feeling on the part of an appreciable number of other students, plus the desire on the part of the Faculty to stimulate more students to exercise their intellectual muscles to a greater extent, were the chief stimuli to this experiment. I hope that the experiment itself will provide a challenge for all of you, no matter which section you are in. I must make one request - that there be no fraternization, as far as the course material is concerned, between the members of the two sections - otherwise it would be difficult to interpret the results.

"Section M is the experimental section; it will meet occasionally, as you will see by the syllabus you will get on Thursday. Its official hours are_____. Section N, the control, will meet Tuesday and Friday and will be run like the standard 62.1 course. In order to maintain the randomness of the distribution between the two classes, it is highly desirable that you remain in the section to which you were assigned. However, if anyone in section M positively hates the idea of being in a section where you'd be on your mettle, will you please speak to me about it after class. In order to determine the caliber of each section at the outset, I'm going to give you two short tests (which will have no bearing on your grade): one, to see how much you already know, or don't know about hygiene, and the other, a vocabulary test."